

App. No. 10/708,301  
Amendment dated January 31, 2005  
Reply to Office action of November 1, 2004

**Amendments to the Specification (other than claims):**

Please replace paragraph [0017] with the following amended paragraph:

[0017] Another advantage is to have the thickness of the metal plate be thicker than the thickness of the ceramic susceptor. Likewise, the diameter of the susceptor preferably is 200 mm or more, while the porosity of the susceptor ceramic preferably is 0.03% or less. Furthermore, warpage in the retaining side of the ceramic susceptor preferably is [[500 □m]] 500 μm or less.

Please replace paragraph [0031] with the following amended paragraph:

[0031] A still further consideration is that semiconductor wafers and LCD glass are heated with the wafers and glass being held on the retaining side of the ceramic susceptor, and if the degree of planarization of the retaining side is poor, the transmission of heat to the object being processed will be non-uniform, worsening the temperature distribution in the surface of the processed object; and although it would thus be better that the retaining side be flat, a warpage of [[500 □m]] 500 μm or less is acceptable because it will have almost no impact on the temperature uniformity of the processed-object surface.

Please replace paragraph [0045] with the following amended paragraph:

[0045] The obtained sintered part is subjected to processing according to requirements. In cases where a conductive paste is to be screen-printed onto the sintered part in the ensuing manufacturing steps, the surface roughness is preferably [[5 □m]] 5 μm or less in Ra. If over [[5 □m]] 5 μm, in screen printing to form a circuit on the compact, defects such as blotting or pinholes in the pattern are liable to arise. More suitable is a surface roughness of [[1 □m]] 1 μm or less in Ra.

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Please replace paragraph [0050] with the following amended paragraph:

[0050] The thickness of the conductive paste is preferably  $[[5 \text{ }\mu\text{m}]]$  5  $\mu\text{m}$  or more and  $[[100 \text{ }\mu\text{m}]]$  100  $\mu\text{m}$  or less in terms of its post-drying thickness. If the thickness is less than  $[[5 \text{ }\mu\text{m}]]$  5  $\mu\text{m}$  the electrical resistance would be too high and the bonding strength would decline. Likewise, if in excess of  $[[100 \text{ }\mu\text{m}]]$  100  $\mu\text{m}$  the bonding strength would be compromised in that case as well.

Please replace paragraph [0055] with the following amended paragraph:

[0055] In that case, the amount of sintering promoter added preferably is 0.01 wt. % or more. With an amount less than 0.01 wt. % the insulative coating does not densify, making it difficult to secure electrical isolation of the metal layer. It is further preferable that the amount of sintering promoter not exceed 20 wt. %. Surpassing 20 wt. % leads to excess sintering promoter invading the metal layer, which can end up altering the metal-layer electrical resistance. Although not particularly limited, the spreading thickness preferably is  $[[5 \text{ }\mu\text{m}]]$  5  $\mu\text{m}$  or more. This is because securing electrical isolation proves to be problematic at less than  $[[5 \text{ }\mu\text{m}]]$  5  $\mu\text{m}$ .

Please replace paragraph [0056] with the following amended paragraph:

[0056] Next, in the present method, the ceramic as substrates furthermore can be laminated according to requirements. Lamination may be done via a bonding agent. The bonding agent--being a compound of Group IIa or Group IIIa elements, and a binder and solvent, added to an aluminum oxide powder or aluminum nitride powder and made into a paste--is spread onto the bonding surface by a technique such as screen printing. The thickness of the applied bonding agent is not particularly restricted, but preferably is  $[[5 \text{ }\mu\text{m}]]$  5  $\mu\text{m}$  or more. Bonding defects such as pinholes

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and bonding irregularities are liable to arise in the bonding layer with thicknesses of less than  $[5 \text{ }\mu\text{m}]$  5  $\mu\text{m}$ .

Please replace paragraph [0066] with the following amended paragraph:

[0066] A further preferable condition is that the surface roughness of the wafer-carrying side be  $[5 \text{ }\mu\text{m}]$  5  $\mu\text{m}$  in Ra. If the roughness is over  $[5 \text{ }\mu\text{m}]$  5  $\mu\text{m}$  in Ra, grains loosened from the AlN due to friction between the ceramic susceptor and the wafer can grow numerous. Grain-loosened particles in that case become contaminants that have a negative effect on processes, such as film deposition and etching, on the wafer. Furthermore, then, a surface roughness of  $[1 \text{ }\mu\text{m}]$  1  $\mu\text{m}$  or less in Ra is ideal.

Please replace paragraph [0071] with the following amended paragraph:

[0071] Embodiment 1 - A granulated powder was prepared by mixing 99.5 parts by weight aluminum nitride powder and 0.5 parts by weight Y<sub>2</sub>O<sub>3</sub> powder and blending with polyvinyl butyral as a binder, and then spray-drying the mixture to granulate it. Here, an aluminum nitride powder having a mean particle diameter of  $[0.6 \text{ }\mu\text{m}]$  0.6  $\mu\text{m}$  and a specific surface area of 3.4 m<sup>2</sup>/g was used. The granules were charged into a mold, sintered and processed, and then a uniaxial press was employed to mold processed parts to dimensions such that they would be 350 mm diameter, 17 mm thickness, and 350 mm diameter, 2 mm thickness. The molded parts were degreased within a nitrogen atmosphere at 900°C, and sintered 5 hours within a nitrogen atmosphere at 1900°C. The thermal conductivity of the obtained sintered parts was 170 W/mK, while the porosity was 0.01%. The sintered parts were put through a polishing operation using a diamond abrasive to produce sintered ceramic parts of the two dimensional categories just noted.

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Please replace paragraph [0072] with the following amended paragraph:

[0072] In addition, a tungsten paste was prepared with a tungsten powder of [[2.0  $\square\text{m}$ ]] 2.0  $\mu\text{m}$  mean particle diameter being 100 parts by weight, and utilizing Y<sub>2</sub>O<sub>3</sub> at 1 part by weight, 5 parts by weight ethyl cellulose, being a binder, and as a solvent, butyl Carbitol™. A pot mill and a triple-roller mill were used for blending the mixture. This tungsten paste was formed into a heater circuit pattern onto the above-noted sintered part of 17 mm thickness by screen-printing, and then the printed paste was fired onto the part by heating it 1 hour at 1850°C.

Please replace paragraph [0073] with the following amended paragraph:

[0073] Furthermore, a kneaded mixture of a bonding glass into which ethyl cellulose had been added was spread onto on the surface of the above-noted sintered part of 2 mm thickness. This were degreased at 900°C within a nitrogen atmosphere, and then the heater-circuit side of the sintered part onto which a heater circuit had been fired was mated with the side of the one onto which the bonding glass had been spread, and the two-ply sintered part was bonded together and heated 2 hours at 1800°C while being subjected to a pressure of 4.9 Pa (5 ton/cm<sup>2</sup>) to produce a ceramic susceptor. The degree of planarization in the processed-object retaining surface of the ceramic susceptor obtained was [[50  $\square\text{m}$ ]] 50  $\mu\text{m}$ .